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To Study the Effectiveness of Yoga and Aerobics in Migraine Patients: A Comparative Study

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Abstract
Migraine is a common, disabling neurological disorder characterized by recurrent, unilateral, throbbing headaches often accompanied by nausea and sensory sensitivity. Affecting approximately 14% of the global population, migraines significantly contribute to years lived with disability, particularly among women of reproductive age. Despite pharmacological treatments, many patients experience inadequate relief or adverse effects, highlighting the need for alternative therapies. This study evaluates the comparative effectiveness of yoga and aerobic exercise in reducing migraine disability using the MIDAS (Migraine Disability Assessment) scale. Yoga, as a mind-body practice, and aerobic exercise, known for cardiovascular benefits, both reduce migraine frequency, intensity, and associated stress. Research indicates that yoga calms the nervous system and improves circulation, while aerobic exercise enhances neurovascular function and releases endorphins. Findings suggest both interventions can serve as valuable complementary therapies to conventional migraine management, with yoga potentially offering superior benefits in pain intensity reduction. Further research is recommended to establish long-term efficacy and adherence.

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Keywords: Migraine, Migraine Disability Assessment (MIDAS), Yoga therapy, Aerobic exercise

Introduction (Migraine)

The word "migraine" comes from the Greek word "hemicrania," which means "one side of the head." This name indicates a defining characteristic of migraines-a burning headache often affecting only one hemisphere. Migraines are more than just headaches; they are a debilitating, throbbing condition that affects approximately 14% of the global population.

As proposed by the Global Burden of Disease (GBD) Study in 2013, migraines are categorized as the sixth most significant cause of years lived with disability [1, 2, 3]. Follow-up studies in 2016, 2019, and 2021 showed: • GBD 16 – 5.6% of all years lived with disability (YLDs), predominantly in women aged 15-49 years. • GBD 19 – the second highest contributor to YLDs globally, accounting for 8.0% among young adult females. GBD 21 – ranked fourth overall cause, second for young adults, and third for young females.

Migraine remains one of the most common and disabling chronic neurological illnesses. Among more than 200 types of headaches, it stands out as the most common and disabling type so far [1]. Migraine is a major headache disorder; it is approximately three times more prevalent in women than in men, a pattern observed globally [8]. The disparity is hormonally based, usually beginning at puberty. Migraine typically affects individuals between the ages of 35 and 45 years, but they can also strike much younger individuals, including children [9, 10]. Consequently, around 25% of women of reproductive age experience migraines compared to 8% of men. They are often persistent and can be lifelong in some cases. Recent-onset episodes represent the most distinguishing characteristic.

The attacks are usually of moderate to severe intensity, unilateral, throbbing type, and aggravated by ordinary physical exertion, lasting from a few hours to two or three days [2]. Most of those who have migraine have a syndrome called "episodic migraine," and it is characterized by having fewer than 15 headache days per month; research has shown that almost two-thirds of those with migraine report about four headache days per month [3].

Pathophsiology

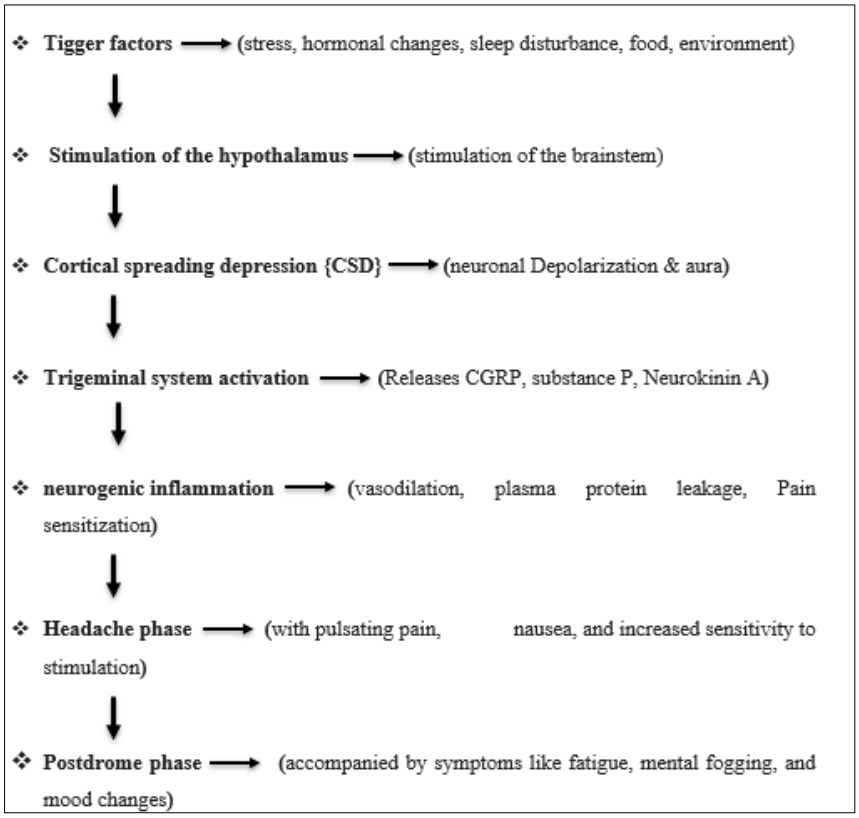

Table 1: Types of migraines: Sources: Refs. [19-21]

Types of migraine	Key symptoms	Duration	Common tigers
Migraine Without Aura (Common Migraine)	Throbbing headache, nausea, sensitivity to light & sound.	4 to 72 hours	Stress, dehydration, lack of sleep, and certain foods
Migraine With Aura (Classic Migraine)	Visual disturbances (flashes, blind spots), dizziness, numbness.	5 mins to 1 hour (aura), then headache	Bright lights, hormonal changes, strong Odors
Chronic Migraine	Headache on 15+ days per month, severe pain, nausea, sensitivity.	Persistent, lasting weeks	Overuse of pain meds, poor sleep, stress, irregular diet
Vestibular Migraine	Dizziness, vertigo, balance issues, nausea, sensitivity to light/sound	A few minutes to hours	Motion sickness, caffeine, alcohol, and stress
Menstrual Migraine	Migraine is linked to the menstrual cycle, throbbing headaches, fatigue, and nausea	4 to 72 hours	Hormonal changes, dehydration, birth control pills

Phases of Migraine

Table 2: Migraine phases with symptoms

Phase	Description	Symptoms
Premonitory Phase	Begins hours to days before migraine onset.	Stiffening of the neck, lethargy/fatigue, yawning, concentration difficulty, mood change, thirst, frequency of micturition
Aura Phase	Local neurologic symptoms are typically reported by women. May precede or occur with the headache.	Visual auras (most typical), sensory auras, and language auras.
Aura Phase	Local neurologic symptoms are typically reported by women. May precede or occur with the headache.	Visual auras (most typical), sensory auras, and language auras.
Postdrome phase	The "migraine hangover" stage follows the headache.	Phase: Drowsiness, fatigue, lack of concentration, phonophobia, increased sensitivity to noise.

Yoga

The National Institutes of Health (NIH) classifies yoga, which has a history of 3,000 years, as an alternative and complementary medical practice. It serves as an integrated well-being approach in Western countries [41]. The Sanskrit origin of the word "yoga" is traditionally associated with the integration of the physical body and the attainment of mental and spiritual realization [42]. Yoga is

a form of mind-body fitness, combining muscular activity with a mindful focus on breathing techniques, self-awareness, and energy.

Yoga and meditation are widely recognized as non-pharmacological methods for improving overall personal health and reducing stress, anxiety levels, chronic pain, headaches, and obesity. Various studies have demonstrated that stress is the leading cause of chronic conditions and non-communicable diseases. It is essential to mitigate the effects of disease by focusing on stress management.

Yoga is a type of complementary and alternative medicine (CAM) that initiates a physiological chain of events, reducing the stress response. It is viewed as a holistic approach to stress treatment. Recently, there has been a significant increase in scientific research on yoga, with many studies evaluating its therapeutic effects and benefits. Yoga practices enhance physical stamina and flexibility, improve respiratory and cardiovascular health, aid in addiction treatment and recovery, reduce stress, anxiety, and depressive symptoms, promote better sleep, and generally enhance well-being and quality of life [46-48].

In the present study, the effect of yoga as an add-on therapy in migraine was evaluated, and drug treatment was found to be not very satisfactory and associated with adverse effects. Several studies have suggested the beneficial effects of yoga in reducing the frequency and intensity of various forms of headaches, particularly migraine and tension headaches [46]. Yoga has been suggested as a potential complementary therapeutic intervention for migraine [47]. Yoga focuses on calming the nervous system, reducing muscle tension, and improving blood circulation, all of which help to prevent migraine symptoms.

Aerobic Exercise

Aerobic exercise (i.e., activities that utilize large muscle groups repetitively and maintain an increased heart rate for sustained periods) can prevent or reduce symptoms of several chronic diseases and medical conditions. This is a well-established therapeutic approach for reducing the burden of migraines in some individuals. As evidence, numerous major health and medical organizations recommend that patients engage in regular exercise as a means of managing and preventing migraine (e.g., the American Academy of Neurology, American College of Physicians, American Headache Society).

Regular exercise is often recommended in migraine treatment (6). Exercise is defined as physical activity that is planned, structured, repetitive, and purposeful in the sense that the improvement or maintenance of physical fitness is the objective (7). Several studies evaluating aerobic endurance training report beneficial effects on both frequency and intensity of migraine, as well as on the duration of the attacks and patient well-being (8–10). It can improve cardiovascular health, reduce stress, and promote overall well-being, which can be especially important for migraine sufferers.

The Migraine Disability Assessment (MIDAS) scale is a validated tool designed to objectively measure the impact of migraines on an individual's daily life and functional ability. Introduced by Dr. Richard B. Lipton and colleagues in the late 1990s, the MIDAS scale was designed to fill the gap in assessing the real-world burden of migraine on work, domestic responsibilities, and social interactions. The MIDAS questionnaire consists of *five key questions* that focus on the number of days in the past three months that migraines have interfered with work or school, household chores, and non-work activities such as family, social, or leisure engagements. The total score helps categorize the level of disability into one of four grades:

Midas score interpretation

MIDAS Score	Disability Level	Impact Description
0–5	Grade I	Minimal impact on daily life.
6–10	Grade II	Some interference with daily activities.
11–20	Grade III	Significant disruption in daily activities.
21+	Grade IV	Very severe impact on work, household, and social activities.

In addition to these questions, two supplementary questions ask about the number of headache days and the average pain intensity, offering a more comprehensive view of the patient's migraine experience. The MIDAS scale is widely used in clinical practice, research studies, and epidemiological surveys due to its simplicity, reliability, and strong correlation with quality of life outcomes. It plays an essential role in treatment planning, monitoring therapy effectiveness, and evaluating the socio-economic impact of migraine. The reliability of MIDAS by intraclass correlation coefficient (ICC) is 0.83, (3) and validity with correlation coefficients ranging from r = 0.63 to 0.79 (63–79%) for headache frequency and r = 0.68 to 0.82(68-82%) with the HIT-6 scale, confirming its effectiveness in assessing migraine-related disability. (4)

Need of Study

Recent studies indicate that migraine is a growingly common health issue, especially in underdeveloped nations, significantly impacting people's quality of life, work, and mental health. Health. With a global prevalence of 14–15%, it is the second leading cause of disability. Several different elements, including environmental triggers, lifestyle choices, and stress, influence its occurrence. Although drug therapies are widely used, they can have adverse effects and might not offer long-term comfort.

This study intends to evaluate how yoga and aerobic workouts affect migraine sufferers and needs to offers alternative treatment possibilities utilizing these holistic approaches, therefore lowering reliance on drugs and enhancing general well-being.

Research Question

- Is yoga more effective than aerobic exercise in reducing migraine disability in patients, as measured by the MIDAS score?

AIM

- To evaluate the comparison of the effectiveness of yoga and aerobic exercise on migraine patients by the MIDAS scale

Objective

1. Evaluate the impact of yoga on the frequency and severity of migraines.
2. Evaluate the impact of aerobic exercise on the frequency and severity of migraines.
3. To compare the effects of yoga and aerobic exercise on migraine patients

Review of literature

1. Megan B Irby *et al*. Headache. (2016 Feb) conducted the study under "Aerobic Exercise for Reducing Migraine Burden: Mechanisms, Markers, and Models of Change Processes".The study aimed The primary aim of this review is to explore the potential of aerobic exercise as a non-pharmacological intervention to reduce the burden of migraine. The article seeks to understand the mechanisms through which aerobic exercise may alleviate migraine symptoms and to propose models for how these changes occur. Objective 1. To examine existing literature on the effects of aerobic exercise on migraine frequency, intensity, and duration. 2. To identify physiological and psychological markers that may mediate the relationship between aerobic exercise and migraine improvement. 3. To develop conceptual models that explain the processes by which aerobic exercise influences migraine outcomes. Result The review found that regular aerobic exercise can lead to a significant reduction in the frequency, intensity, and duration of migraine attacks. These beneficial effects are attributed to several interconnected mechanisms. Firstly, aerobic exercise improves cardiovascular health and enhances neurovascular function, which can reduce the likelihood of migraine triggers. Secondly, it promotes the release of endorphins—natural pain-relieving chemicals—which help in managing migraine pain. Additionally, aerobic exercise reduces psychological stress and anxiety, both of which are common migraine triggers. Lastly, it contributes to better sleep quality, which is essential in preventing migraine episodes. Overall, the review supports aerobic exercise as a promising non-pharmacological intervention for managing migraines.

2. Álvaro reina-Varona, Beatriz Madroñero-Miguel, *et al*. (2024 Aug) conducted the study under "Efficacy of various exercise interventions for migraine treatment: A systematic review and network meta-analysis." The study aimed to compare the effectiveness of different exercise modalities—yoga, high-intensity aerobic exercise, and moderate-intensity aerobic exercise—in reducing migraine frequency, intensity, duration, and disability. A systematic review of 28 clinical trials involving 1501 migraine patients was performed using network meta-analysis with frequentist and Bayesian models to evaluate treatment efficacy. Results showed that all three exercise modalities significantly reduced migraine frequency compared to pharmacological treatment alone, with yoga being the most effective for intensity reduction, high-intensity aerobic exercise for duration, and moderate-intensity aerobic exercise for disability improvement. Despite promising findings, the study highlighted the need for further research due to low-quality evidence.

3. Olivia Begasse de Dhaem, Carolyn Bernstein *et al*. MAY 2024 conducted a study titled **"Yoga for Migraine Prevention: An Ancient Practice with Evidence for Current Use"**. The study **aimed** to review recent literature on yoga as a preventive treatment for migraines, whether as an adjunct or standalone therapy. Using PubMed and Litmaps, research from 2018 to 2023 was analysed to assess study designs and types of yoga interventions. The review included two systematic reviews and six studies, which provided class III evidence and a grade B recommendation for yoga as an adjunct migraine treatment. Findings indicated that yoga significantly reduces headache frequency, disability, and pain intensity, while enhancing self-efficacy. Additionally, two studies suggested that yoga, when used as a standalone treatment, reduces pain intensity, disability, and perceived stress. However, the review highlighted the necessity for further research on long-term efficacy, adherence to yoga practice, and its role in the prodromal or acute headache phase.

4. Sweety Kumari, Minakshi Dhar, et.al. 2022 Sep conducted study under Yoga as an Adjuvant therapy in management of migraine- An open label randomized trial: - This study aimed to evaluate the effect of yoga as an add-on therapy for migraine, considering the limitations and adverse effects of conventional drug treatments. Patients aged 18–60 years suffering from migraine were recruited and diagnosed based on the International Headache Society's classification. After baseline assessments, participants were randomly assigned to either conventional therapy (C group) or conventional therapy plus yoga (C+Y group), with the latter practicing yoga for five days a week over 12 weeks. Outcome measures included headache frequency, duration, severity (via VAS), and autonomic parameters such as heart rate variability, assessed at the 14th week. Statistical analysis involved the independent t-test and the Mann-Whitney U test. Out of 170 screened patients, 34 completed the study. Both groups showed significant improvements in clinical and autonomic parameters ($P < 0.0001$). However, the C+Y group had greater reductions in VAS score ($P = 0.041$) and heart rate variability ($P = 0.032$). Despite these benefits, no significant difference in clinical outcomes was observed between the groups, concluding that yoga mainly enhanced symptom relief rather than altering overall treatment effectiveness.

5. Yohannes W Woldeamanuel [1], Arão B D Oliveira et.al. 2022 Oct conducted study under What is the efficacy of aerobic exercise versus strength training in the treatment of migraine? A systematic review and network meta-analysis of clinical trials: This study aimed to compare the efficacy of different exercise interventions in reducing migraine frequency, given the lack of head-to-head comparisons in existing research. A systematic review and network meta-analysis were conducted using published clinical trials from databases like Web of Science, PubMed, and Scopus up to July 30, 2022. The analysis included both aerobic and strength/resistance training protocols, evaluating their impact on monthly migraine frequency. The study compared moderate-intensity aerobic exercise, high-intensity aerobic exercise, and strength/resistance training, alongside migraine medications such as topiramate and amitriptyline. The Cochrane Risk of Bias version 2 (RoB2) tool assessed the quality of included studies. Results from 21 clinical trials involving 1,195 migraine patients (mean age 35 years, male-to-female ratio 6.7) indicated that strength training was the most effective intervention (MD = -3.55), followed by high-intensity (-3.13) and moderate-intensity aerobic exercise (-2.18). Medication interventions, including topiramate and amitriptyline, were less effective. Although 85% of the studies had a low risk of bias, 15% showed a high risk due to issues in randomization and handling of missing data. The study concluded that strength training was the most effective exercise intervention for reducing migraine burden.

6. Jigar N Mehta, Shweta Parikh, *et al*. 2021 Jan conducted study under Study of Additive Effect of Yoga and Physical Therapies to Standard Pharmacologic Treatment in

Migraine: - This study aimed to evaluate the effectiveness of physical and yoga therapies as adjuvant treatments alongside standard pharmacologic therapy in patients with migraines. A total of 61 patients diagnosed with migraines were randomly assigned to three groups: standard treatment alone, standard treatment with physical therapy, and standard treatment with yoga therapy. Participants performed their respective therapies daily for three months, with weekly telephonic reminders. Outcome measures included headache frequency, the Short-Form McGill Pain Questionnaire (SF-MPQ), and the Headache Impact Test-6 (HIT), assessed at baseline and monthly for three months. Statistical analysis using paired t-tests and analysis of variance revealed a significant reduction in headache frequency, severity, and sensory-affective pain ratings across all groups ($p < 0.005$). However, the groups receiving yoga or physical therapy showed a greater reduction in headache severity and frequency than the standard treatment group. The findings suggest that either physical or yoga therapy as an adjunct to pharmacologic treatment may improve quality of life and reduce migraine frequency.

7. **Tae-Jin Song, Min Kyung Chu (2021 Feb). Conducted a study on Exercise in the Treatment of Migraine, Including Chronic Migraine.** The study **investigates** the effects of exercise on migraine, particularly its role as a potential treatment. A close relationship between physical activity and migraine has been observed in clinical and population-based studies. Recent randomized controlled trials indicate that aerobic exercise significantly improves migraine symptoms, suggesting its efficacy as a preventive treatment. However, the impact of anaerobic exercise, as well as flexibility, coordination, and relaxation exercises, on migraines remains unclear due to insufficient data. Potential mechanisms for migraine relief through exercise include the activation of the endogenous opioid and cannabinoid systems, the release of brain-derived neurotrophic factors, reduced inflammation, and psychological benefits. While aerobic exercise presents a promising, non-pharmacological approach to migraine prevention with minimal side effects, further research is needed to establish standardized exercise programs for migraine management.

8. Anand Kumar, Gautam Sharma et.al. (May 2020) conducted the study under "Effect of yoga as add-on therapy in migraine (CONTAIN): A randomized clinical trial" Patients were enrolled with age between 18-50 years with a diagnosis of episodic migraine and were randomized into medical and yoga groups (1:1). Between April 2017 and August 2018, 160 patients with episodic migraine were randomly assigned to medical and yoga groups. A total of 114 patients completed the trial. Baseline measures were comparable except for a higher mean headache frequency in the yoga group. Compared to medical therapy, the yoga group showed a significant mean delta value reduction in headache frequency by MIDAS score (7.85 [4.98-10.97]; $p < 0.0001$). They found that Yoga as an add-on therapy in migraine is superior to medical therapy alone and may also be useful to integrate a cost-effective and safe intervention.

9. Joris Lemmens, Joke De Pauw, et.al. **2019 Feb** conducted study under **the effect of aerobic exercise on the number of migraine days, duration and pain intensity in migraine: A systematic literature review and meta-analysis: -** The study aimed to assess the effectiveness of aerobic exercise as a prophylactic treatment for migraine by analysing its impact on migraine frequency, duration, and pain intensity. A systematic review and meta-analysis were conducted, screening three online databases (PubMed, Cochrane Library, and Web of Science) and selecting six studies that met predefined inclusion and exclusion criteria. Pooled data analysis revealed a significant reduction in the number of migraine days per month (mean reduction: 0.6 ± 0.3 days). However, due to variability in outcome measurements, other results were not consistently pooled. Individual studies indicated small to moderate reductions in migraine attack duration (20-27%) and pain intensity (20-54%) following aerobic exercise interventions. The study concluded that aerobic exercise therapy offers moderate-quality evidence for reducing migraine frequency, though no clear conclusions could be drawn regarding pain intensity or attack duration due to inconsistent effect sizes. Future studies should employ standardized outcome measures and more intense training programs for better insights.

10. Faisal Mohammad Amin [1], Stavroula Aristeidou [2] et.al. 2018 Sept conducted study under **the association between migraine and physical exercise: -** This study **explores** the role of exercise in migraine prevention, addressing its epidemiological, therapeutic, and pathophysiological implications. Given the unmet need for effective migraine treatments, exercise is considered a potential intervention, though its precise role remains uncertain. A literature review was conducted using PubMed with the search terms "**migraine and exercise**." Findings indicate an inverse relationship between physical activity levels and migraine frequency, with low exercise levels associated with increased migraine prevalence. Experimental studies suggest that exercise can act both as a migraine trigger and a prophylactic measure. Potential mechanisms for triggering migraines include the acute release of neuropeptides such as calcitonin gene-related peptide and alterations in hypocretin or lactate metabolism. Conversely, migraine prevention through exercise may be mediated by increased beta-endorphins, endocannabinoids, and brain-derived neurotrophic factors. Despite **evidence suggesting** that regular exercise may lower migraine frequency by modifying migraine thresholds, further research is needed to determine the optimal frequency and intensity of exercise for migraine prevention.

11. S Darabaneanu, C H Overath *et al.* 2011 Jun conducted a study **on Aerobic exercise as a therapy option for migraine: a pilot study**: - The study **aimed** to investigate the effect of aerobic exercise on migraine and develop a suitable training program for migraine patients. This pilot study included 16 participants, with 8 undergoing a 10-week aerobic running program consisting of three workouts per week, designed by sports scientists to enhance fitness levels. Physical fitness was assessed using the PWC 150 test. A control group of 8 patients did not receive any special physical training. Results indicated a significant reduction in migraine days per month ($p=0.048$) and attack intensity ($p=0.028$) in the exercise group. Additionally, increased fitness levels correlated with lower stress levels, with reductions in stress-related behaviours. The study **concluded** that improving fitness through aerobic exercise can serve as an alternative therapy for migraine management, with higher fitness levels (PWC 150) predicting better migraine outcomes ($r=0.409$; $p=0.031$).

12. Sara Maria Dittrich, Verena Günther, *et al.* 2008 Jul conducted a study on **Aerobic exercise with relaxation:**

influence on pain and psychological well-being in female migraine patients in The objective of this pilot study The study **aimed** to assess the effects of an aerobic exercise program combined with relaxation techniques on migraine pain intensity and psychological variables. The procedure involved a controlled, randomized design, with half of the participants receiving the aerobic exercise intervention alongside standard medical care. The intervention consisted of a six-week, twice-weekly program including 45 minutes of gymnastics with music and 15 minutes of progressive muscle relaxation. The results indicated a significant reduction in self-rated migraine pain intensity, though improvements in depression-related symptoms were observed only within the exercise group. However, no significant differences in other psychological variables were found between the groups.

13. P J John, Chandra M Sharma et.al. 2007 May conducted **the study on Effectiveness of yoga therapy in the treatment of migraine without aura: a randomized controlled trial**. Several studies have explored complementary and alternative medicine for migraine treatment, but there is limited research on yoga therapy's effectiveness. This study evaluated the holistic approach of yoga therapy for migraine management compared to self-care through a randomized controlled trial. Seventy-two patients with migraine without aura were randomly assigned to either a yoga therapy group or a self-care group for three months. The primary outcomes measured were headache frequency, severity (using a numerical scale), and pain components (McGill pain questionnaire). Secondary outcomes included anxiety and depression (Hospital Anxiety and Depression Scale) and medication use. The results showed significant improvements in the yoga group compared to the self-care group, with reductions in headache intensity, frequency, pain rating indices, anxiety, depression scores, and medication use ($P < .001$). The study concluded that yoga therapy significantly reduces migraine frequency and severity, supporting its potential as an effective therapeutic intervention. Further research is warranted to validate these findings.

Hypotheses

- **Null Hypothesis (H0):** There is no effect of yoga and aerobic exercise in the reduction of intensity, frequency of migraine in migraine patients.

- **Alternative Hypothesis (H1)**

1. There is an effect of yoga in the reduction of intensity, frequency of migraine in migraine patients.
2. There is an effect of aerobic exercise in the reduction of intensity, frequency of migraine in migraine patients.
3. There is an effect of comparing yoga and aerobic in the reduction of intensity, frequency of migraine in migraine patients.

Material

- Yoga mat
- Yoga attire
- Yoga blocks
- Proper footwear
- Resistance band
- Heart rate monitor
- Digital BP apparatus
- Water bottle
- MIDAS Scale

Methodology

1. **Study design**: comparative study
2. **Method of sampling**: purposive sampling
3. **Sample size:** 40n (20n) in each group.

Group A: aerobic exercise
Group B: yoga exercise

4. **By using the Formula:** $n = 2\frac{S^2(Z1+Z2)^2}{(M_1-M^2)^2}$

$$n = 2\frac{1.93^2(1.64+1.64)^2}{(4.50-2.03)^2}$$

[Z1= 1.93 **Z2=** 1.64 **M1=** 4.50 **M2=** 2.03 **S2=** 1.93**]**

5. **Place of study:** Medicine OPD of a tertiary care hospital
6. **Study duration:** 3 months
7. **Target population**: Migraine with or without aura, diagnosed by a physician. Patients are currently not on medication in the age group of 30-50 years.

Outcome Measures

MIDAS SCALE (Migraine Disability Assessment scale**)**

MIDAS QUESTIONNAIRE

INSTRUCTIONS: Please answer the following questions about ALL your headaches you have had over the last 3 months. Write your answer in the box next to each question. Write zero if you did not do the activity in the last 3 months.

1	On how many days in the last 3 months did you miss work or school because of your headaches?	☐☐ days
2	How many days in the last 3 months was your productivity at work or school reduced by half or more because of your headaches? *(Do not include days you counted in question 1 where you missed work or school)*	☐☐ days
3	On how many days in the last 3 months did you not do household work because of your headaches?	☐☐ days
4	How many days in the last 3 months was your productivity in household work reduced by half or more because of your headaches? *(Do not include days you counted in question 3 where you did not do household work)*	☐☐ days
5	On how many days in the last 3 months did you miss family, social or leisure activities because of your headaches?	☐☐ days
	TOTAL	☐☐ days
A	On how many days in the last 3 months did you have a headache? *(If a headache lasted more than 1 day, count each day)*	☐☐ days
B	On a scale of 0–10, on average how painful were these headaches? *(Where 0 = no pain at all, and 10 = pain as bad as it can be)*	☐

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Once you have filled in the questionnaire, add up the total number of days from questions 1–5 (ignore A and B).

Grading system for the MIDAS Questionnaire:

Grade	Definition	Score
I	Minimal or infrequent disability	0–5
II	Mild or infrequent disability	6–10
III	Moderate disability	11–20
IV	Severe disability	21+

The reliability of MIDAS by intraclass correlation coefficient (ICC) is 0.83, and validity with correlation coefficients ranging from r = 0.63 to 0.79 (63–79%) for headache frequency and r = 0.68 to 0.82 (68-82%) with the HIT-6 scale, confirming its effectiveness in assessing migraine-related disability.[3,4]

Criteria for selection
(Inclusion and Exclusion)
Criteria for Inclusion

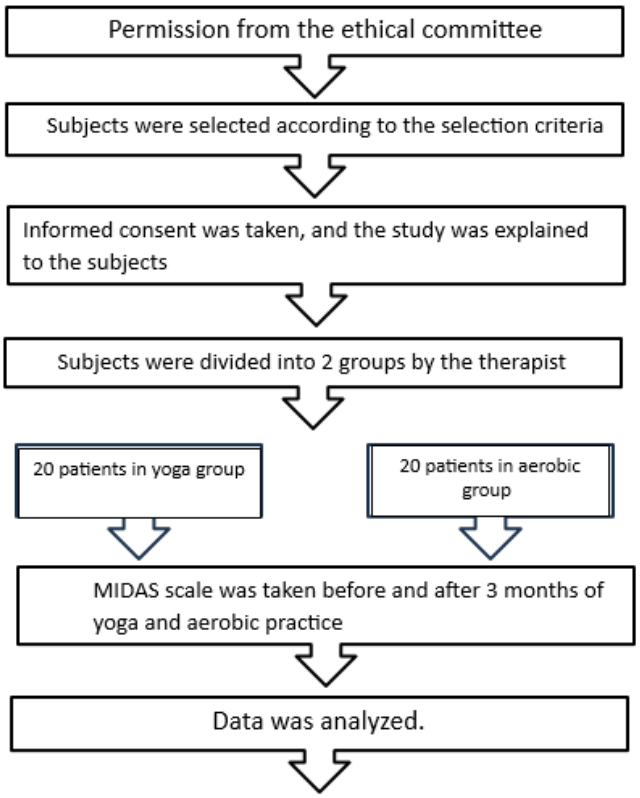
- Participants aged 30 and 50 years.
- Individuals with migraines should have a clinical diagnosis based on the International Classification of Headache Disorders (ICHD) criteria.
- Migraine with Aura and without Aura.

- Patient with moderate to severe disability (MIDAS score >11)
- Migraine Frequency: 2-6Attacks/Month.
- Migraine duration: lasting between 4-12 hours.
- Not on medications.
- Willing to participate.

Criteria for exclusion

- Individual with Secondary Headaches.
- Severe anxiety, depression, schizophrenia, epilepsy, or other chronic neurological or psychiatric disorders.
- Women who are pregnant or nursing.
- Respiratory or Cardiovascular Conditions.
- Recent Head or Neck Injury History.
- Non-compliance or lack of consent.

Procedure



Procedure
(In detail)

- Permission from the Ethical Committee: - Before commencing the study, permission is received from the ethical committee and the principal of Dr. Ulhas Patil College of Physiotherapy to follow ethical principles protecting the rights of the participants in the research process.
- Choose Subjects by Criteria: - The participants were chosen by the criteria given in terms of inclusion and exclusion of various participants in order to conduct the study with accuracy and relevance.
- Informed consent and explanation of study- The selected participant was approached and informed regarding the study, including their purpose and study methodology, etc. Once your study was approved, they obtained informed consent from each participant before continuing.
- Demarcation of Group Participants: - The participant subjects was randomly assigned by a therapist to divide them into two groups:

Group 1: Yoga therapy group
Group 2: Aerobic exercise group

- Assessment Using the MIDAS Scale: The Migraine Disability Assessment Scale (MIDAS) was employed to evaluate the impact of migraines on participants' daily lives.

Baseline MIDAS scores is documented before initiating the intervention.

Group A

Underwent aerobic exercise training Aerobic exercise, such as brisk walking, jogging, or biking.

In this, firstly, there was:

- warm up (wrist and hand rotation Neck flexion & extension Shoulder rotation) **10 mins.**
- Brisk walking
- Jogging
- Biking
- Aerobic dance
- Cool down (stretching exercise) **10 mins**

45 mins

- After each exercise 2-3sec of gap.
- For aerobic exercise total time will be 65 mins.
- Days will be 3 alternate days in a week for 3 months.

Daily aerobic schedule (1 hour)

Activities	Duration
Warm up (gentle neck and shoulder stretch)	5 mins
Low-impact cardio (marching in spots, side steps, arm swing, knee taps)	15 mins
Aerobic dance (freestyle movement)	10 mins
Brisk walking or light jogging	10 mins
Cycling or low stepping	10 mins
Cool down (gentle stretch)	5 mins
Deep breathing & relaxation	5 mins

Weekly variation plan

Week	Special addition
Week 1-4	Focus on slow, controlled movement & breathing technique.
Week 5-8	Add light resistance (small weights, resistance band) to step aerobics.
Week 9-12	Incorporate mindful movement practices.

Group B

Has undergone yoga training

In this, firstly, there was

- Breathing exercise such as hand stretch, ankle stretch, and leg raise with breathing {inhale and exhale} 10 mins

Different asanas

- Hastapadasana (Standing Forward Bend)
- Setu Bandhasana (Bridge Pose)
- Shishuasana (Child Pose)
- Marjariasana (Cat Stretch)
- Paschimottanasana (Two-legged Forward Bend)
- Adho Mukha Svanasana (Downward Facing Dog Pose)
- Padmasana (Lotus Pose)
- Shavasana (Corpse Pose)

a) Hastapadasana (Standing Forward Bend):

Procedure

- Stand straight with feet together and arms alongside the body.
- Balance your weight equally on both feet.
- Breathing in, extend your arms overhead.
- Breathing out, bend forward and down towards the feet.
- Stay in the posture for 20-30 seconds and continue to breathe deeply
- Keep the legs and spine erect; hands rest either on the floor, beside the feet, or on the legs.

b) Setu Bandhasana (Bridge Pose)

Procedure

- To begin, lie on your back.
- Fold your knees and keep your feet hip distance apart on the floor, 10-12 inches from your pelvis, with knees and ankles in a straight line.
- Keep your arms beside your body, palms facing down.
- Inhaling, slowly lift your lower back, middle back, and upper back off the floor.
- Hold the posture for 1-2 minutes and exhale as you gently release this yoga pose.

c) Shishuasana (Child Pose)

Procedure

- Sit on your heels. Keeping your hips on the heels, bend forward, and lower your forehead to the floor.
- Keep the arms alongside your body with hands on the floor, palms facing up.
- Gently press your chest against the thighs.
- Hold for 20-30 sec.
- Slowly come up to sit on the heels, uncurling vertebra by vertebra and relaxing.

d) Marjariasana (Cat stretch)

Procedure

- Come onto your fours. Form a table such that your back forms the table top and your hands and feet from the legs of the table.
- Keep your arms perpendicular to the floor, with the hands directly under the shoulders and flat on the ground; your knees are hip-width apart.
- Hold the Cat pose and take long, deep breaths.
- As you exhale, drop your chin to your chest and arch your back up.
- Hold for 3-4 sec. Continue five or six times.

e) Paschimottanasana (Two-legged Forward bend)

Procedure

- Sit up with the legs stretched out straight in front of you, keeping the spine erect and toes flexed toward you.
- Breathing in, raise both arms above your head and stretch up.
- Breathing out, bend forward from the hip joints, chin moving toward the toes.
- Place your hands on your legs, wherever they reach, without forcing.
- Breathing in, lift your head slightly and lengthen your spine.
- Breathing out, gently move the navel towards the knees.
- Repeat this movement two or three times.
- Drop your head down and breathe deeply for 20-60 seconds**.**

f) Adho Mukha Svanasana (Downward Facing Dog Pose)

Procedure

- Come onto your fours. Form a table such that your back forms the table top and your hands and feet from the legs of the table.
- As you breathe out, lift the hips, straightening the knees and elbows, and form an inverted V-shape with the body.
- Hands are shoulder width apart; feet are hip width apart and parallel to each other. Toes point straight ahead.
- Press your hands into the ground. Widen through the shoulder blades. Keep the neck lengthened by touching the ears to the inner arms.
- Hold the downward dog pose for 10-15 seconds and take long, deep breaths. Look towards the navel.
- Exhale. Bend the knees, return to table pose.

g) Padmasana (Lotus Pose)

Procedure:

- Sit on the floor with your legs stretched out straight in front.
- Bend the right knee and grasp the right foot with both hands and place it on top of the left thigh, bringing the heel as close to the navel as possible.
- Repeat the same process with the left knee and foot.
- Both knees should be on the ground, and the soles of the feet should be pointed upward. The spine is held straight but not rigid.
- 1-5 mins.

h) Shavasana (Corpse Pose)

Procedure

- Lie flat on your back.
- Legs should be separated.
- Keep your arms at your side and your palms facing up. Just relax.
- Close your eyes and breathe deeply and slowly through the nostrils.
- Start concentrating from your head to your feet. Don't move ahead without relaxing a particular part of the body.
- Practice for 10 minutes after yoga practice.

  - After each 2 yoga pose **2-3 sec** of gap
  - The total yoga practice for **65 mins.**
  - Duration for yoga practice will be **3 alternate days** in a week for **3 months.**


Yoga Routine Schedule (1 hour)

Time slots	Activities	Duration
5 mins	Warm up (gentle movements & breathing)	5 mins
10 mins	Marjariasana ((Cat Stretch)	5 min
	Shishuasana (Child Pose)	5 min
15 min	Adho Mukha Svanasana (Downward Dog)	5 min
	Setu Bandhasana (Bridge Pose)	5 min
	Hastapadasana (Standing Forward Bend)	5 min
15 min	Paschimottanasana (Seated Forward Bend)	5 min
	Padmasana (Lotus Pose) Meditation	5 min
	Pranayama (Breathing Techniques)	5 min
10 min	Shavasana (Corpse Pose) -Relaxation	10 min

Weekly Variation Plan

Week	Special addition
Week 1-4	Focus on holding each asana for a few breaths, understanding form.
Week 5-8	Increase duration per pose, deepen stretches.
Week 9-12	Introduce breathing techniques (Pranayama) while holding asanas for better relaxation and strength.

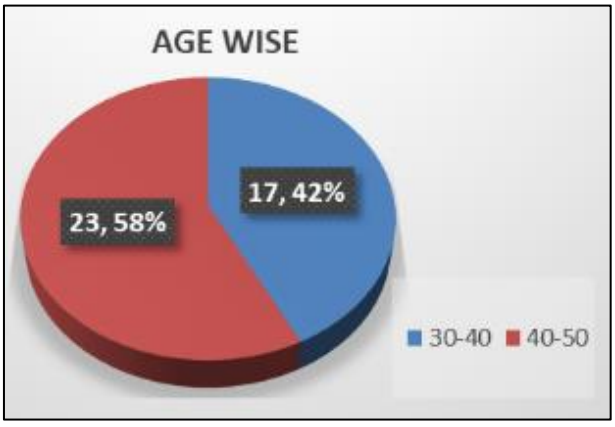
Statically Analysis

- The patient data and test results of the subject were entered in an MS Excel sheet before it was statistically analyzed.
- A total of 40 migraine-diagnosed patients are included in the study.
- The data obtained from participants was statistically analyzed.
- Mean and standard deviation were calculated for all the needed variables.

Result

Table 3: Age-wise distribution of both study subjects

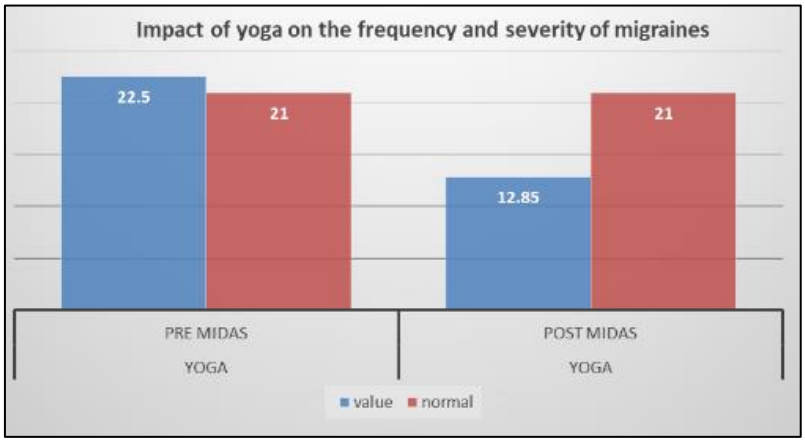
Age group	No. of subject
30-40	17
40-50	24
Min	**Max**
30	50



Comment – Total of 40 subjects are included in this study. 42% of subjects are between the ages of 30-40 years, and 58% of subjects are between the ages of 40-50 years.

Table 4: Evaluate the impact of yoga on the frequency and severity of migraines

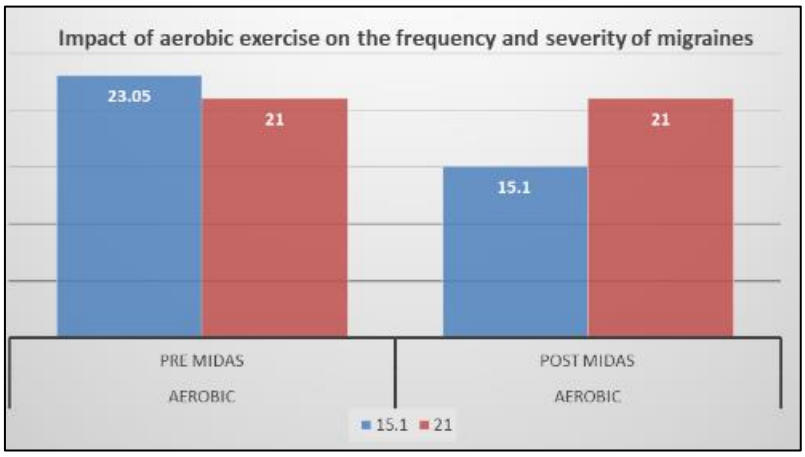
	Mean ± SD	P value
Pre MIDAS	22.5 ± 2.03	P<0.0001
Post MIDAS	12.85 ± 1.81	



Comment: The table and graph show a significant reduction in MIDAS scores after three months of yoga, with the mean decreasing from 22.5 ± 2.09 to 12.85 ± 1.81. The p-value (<0.0001) indicates that this improvement is statistically significant

Table 5: Evaluate the impact of aerobic exercise on the frequency and severity of migraines

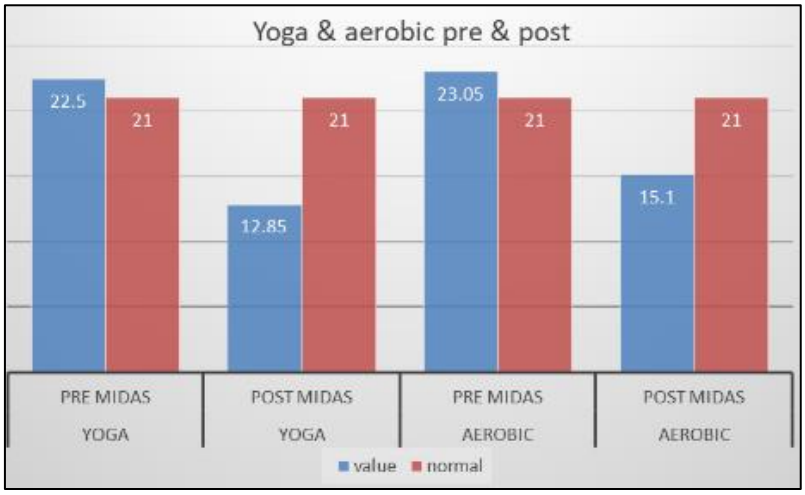
	Mean ± SD	P value
Pre MIDAS	23.05 ± 1.82	P<0.0001
Post MIDAS	15.15 ± 3.09	



Comment - The table and graph show a significant reduction in MIDAS scores after three months of aerobic exercise in migraine patients. The mean MIDAS score decreased from 23.1 ± 1.71 to 15.15 ± 2.87, with a statistically significant p-value (P<0.0001).

Table 6: Compare the effect of yoga and aerobic exercise on migraine patients

Group	Pre and post	Mean SD	P value
Aerobic	Pre value	23.5 ± 1.82	P<0.0001
	Post value	15.15 ± 3.09	
Yoga	Pre value	22.5 ± 2.03	P<0.0001
	Post value	12.85 ± 1.81	



Comment - The above table and graph show the statical analysis of aerobic and yoga as per the MIDAS score for 3 months

Discussion

- Migraine is a common neurological disorder that significantly affects daily life, often leading to disability and decreased productivity. The **Migraine Disability Assessment (MIDAS) Score** is a well-established tool used to measure the impact of migraines on daily activities. This study examines the effects of **yoga and aerobic exercise** on MIDAS scores over three months to determine their effectiveness in reducing migraine-related disability. The findings suggest that **non-pharmacological interventions**, such as yoga and aerobic exercise, can play a crucial role in managing migraines.
- **Age Distribution of Subjects** The study included **41 subjects**, distributed into two age groups:
  30–40 years: 17 subjects (42%)
  40–50 years: 24 subjects (58%)

The participants' ages ranged from **30 to 50 years**, with a majority in the **40–50 age group**. This distribution ensures that the study findings apply primarily to middle-aged adults.

- **Table 2 Results: Pre-Yoga MIDAS Score:** 22.5 ± 2.03 & **Post-Yoga MIDAS Score:** 12.85 ± 1.81 **P-value:** < 0.0001 (highly significant)

Yoga led to an approximate **42.9% reduction** in MIDAS scores, indicating a significant improvement in migraine-related disability.

The highly significant p-value confirms that these improvements are **not due to chance**.

- **Table 3 Results: Pre-Aerobic MIDAS Score:** 23.05 ± 1.8 & **Post-Aerobic MIDAS Score:** 15.15 ± 3.09 P-**value:** < 0.0001 (highly significant)

Aerobic exercise resulted in a **34% reduction** in MIDAS scores, which is significant but **less than that observed with yoga**.

- Aerobic exercise plus yoga has different effects on the body, particularly in how they affect migraine management. Yoga includes meditation, deep breathing along with relaxation. This involvement activates the parasympathetic nervous system. This activation helps in reducing stress. Stress often triggers migraines. Aerobic exercise can cause the release of endorphins, substances that naturally improve mood. Vigorous workouts can increase cortisol levels. This hormone is related to stress and can cause migraines

Through deliberate movements and breathing, yoga gradually improves blood flow. This helps avoid sudden changes in blood pressure. Such changes can cause migraine episodes. In contrast, aerobic exercise often speeds up heart rate plus blood pressure quickly which can cause headaches in people susceptible to migraines.

Intensity for yoga is all about low to moderate levels, making it a gentle and sustainable choice for those dealing with migraines. This approach helps to avoid the risk of overdoing it. On the other hand, moderate to high-intensity aerobic workouts can significantly increase body temperature, potentially leading to dehydration and exercise-induced headaches. Another yoga is its ability to promote muscle relaxation. The various poses specifically focus on the neck, shoulders, and scalp muscles, helping to ease tension that often contributes to migraines. Poses like Shavasana (Corpse Pose) and Marjariasana (Cat Stretch) are especially effective for relieving that discomfort. In contrast, aerobic exercises can sometimes result in muscle fatigue and stiffness if you don't incorporate enough stretching, which could make tension-related headaches worse.

Yoga has a unique way of influencing the nervous system. When you practice yoga, it activates the parasympathetic nervous system, often called the 'rest and digest' system. This activation helps to soothe the brain, which can significantly reduce both the intensity and frequency of migraines. On the other hand, aerobic exercise tends to activate with the 'fight or flight' response. This activation can increase excitability and tension, potentially triggers migraine. yoga is that the risk of triggering migraines is quite low. The practice is gentle and focuses on mind-body awareness, avoiding any sudden movements. In contrast, aerobic workouts often involve fast, repetitive motions that can create neck tension, dehydration, or overheating—factors that are known to trigger migraines[17.18]

- Anand Kumar *et al*. (2020) carried out a randomized clinical trial entitled "Effect of yoga as add-on therapy in migraine (CONTAIN)" on 160 patients aged 18-50 years with episodic migraines. The research proved that yoga reduced headache frequency substantially when compared to medical therapy, with a considerable mean delta value decrease in MIDAS scores (7.85 [4.98-10.97]; $p < 0.0001$), confirming that yoga is a better and less expensive adjuvant therapy for migraines.
- In present study it aims to compare the efficacy of yoga and aerobic exercise in particular for migraine patients between 30-50 years old, using a sample population of 40 participants (20 per group). It assesses the effect of both interventions on migraine frequency, severity, and overall quality of life based on the MIDAS scale, highlighting the general advantages of both modalities, with particular attention to the potential decrease in the use of pharmacological interventions, and identifying the future research agenda. This comparative and age-specific strategy, coupled with the stress emphasis and holistic rewards, sets your study apart from that of Anand Kumar *et al*. by providing useful knowledge on migraine treatment strategies.
- Yohannes W. Woldeamanuel *et al*. (2022) published a systematic review and network meta-analysis entitled "What is the efficacy of aerobic exercise versus strength training in the treatment of migraine?" The study compared the effectiveness of different exercise interventions, such as moderate and high-intensity aerobic exercise and strength training, in decreasing migraine frequency. Reviewing data from 21 clinical trials with 1,195 patients with migraine, the outcome of the research revealed that strength training was most effective in reducing the burden of migraine, followed by high-intensity and moderate-intensity aerobic exercise, and less effective were the medication interventions.
- In present study it compares directly yoga and aerobic exercise as regards migraine control among a specifically selected age range of 30-50 years. This study highlights the holistic advantage of yoga, involving stress management and relaxation, and in addition to aerobic exercise, measures migraine disability and

quality of life using the MIDAS scale. This work also touches upon the possibility of limiting dependence on drug therapy and providing useful evidence toward non-drug management strategies for migraine.

Conclusion

A study that compared yoga plus aerobic exercise employed the MIDAS scale to assess migraine patients. It revealed that each practice helped lower how often migraines occurred, how strong they were, as well as how much they impacted a patient's abilities. Yoga appeared to provide superior benefits regarding stress reduction, relaxation, as well as lasting progress on migraine disability.

Overall, both aerobic exercise and yoga are beneficial to migraine management according to the MIDAS scale. Yet yoga can induce a more holistic and sustainable decrease in migraine disability due to its focus on stress relief and relaxation.

Future Scope

- Research on potential comparative effects of yoga and aerobic exercise for managing migraines by applying the MIDAS scale should be done for long-term studies. These studies can help in the assessment of sustained benefits, adherence, and relapse rates across various populations.
- The examination of the role of lifestyle factors such as sleep quality, diet, and mental health, in addition to these exercises for a more holistic approach, is also very important. Furthermore, the combination of both yoga and aerobic exercise with pharmacological treatments might be able to help in the optimization of migraine management and, therefore, can potentially reduce medication dependency as well as the associated side effects.

Clinical Implication

- A comparison of yoga and aerobics in treating migraines using the MIDAS scale is clinically important. This contrasts the claim of non-pharmacological interventions' inability to reduce migraine frequency, intensity, and disability by providing the patient a choice in changing aspects of his/her life accordingly, and thereby curing the person without the use of traditional medication.
- Furthermore, if such exercises are made part of the standard of care for migraine community, they may not only enhance the quality of life for the patient but also may decrease the drug dependence level and bring about a better prognosis. The future guidelines should solidify the place of structured exercise programs, which can be customized based on the severity and the patient's needs, and which will significantly contribute to the migraine patient's recovery and prevention.

Limitation

- Differences in migraine triggers, severity, and comorbid conditions between participants are another issue of concern. These may introduce variability that will make the findings difficult to generalize to a larger population.
- The study period might be too short to accurately determine long-term sustainability as well as relapse rates. More definitive results will be obtained by having longer follow-up intervals. Future studies should try to overcome such drawbacks by implementing larger sample sizes, longer observation durations, and more controlled experiments.

Annexure-1

Consent form

I _____ voluntarily agree to participate in the study "**To study the effectiveness of yoga and aerobic on migraine patients: comparative study.**" The nature and hazards involved in this study have been fully explained to me. I understand that I may withdraw from this study at any time.

- I consent to the data being collected and stored at the Department of Physiotherapy, and for the data to be used for research purposes.
- I understand that I am assured of anonymity and that the data will be treated as a confidential document. I understand that I may also contact the Dr. Ulhas Patil College of Physiotherapy Committee if I feel I have been unfairly treated.

Signature of the subject: - _____
Date: - _____
Place: - _____

Annexure – 2

Case record form

- **Name-**
- **Age-**
- **Gender-**
- **Migraine duration (years)-**
- **Frequency of migraine attacks (per month)-**
- **Group allocation- Yoga \ Aerobic-**

MIDAS Scale	Pre intervention	Post intervention
Missed Work/School date		
Reduced productivity at school/ work (half days)		
Missed household work days		
Reduced household productivity		
Missed social, family,/Leisure activity		
Total MIDAS Score		
Clinical Parameters	Pre intervention	Post intervention
Average migraine intensity (VAS scale 0-10)		
Frequency of migraine episodes (per month)		
Duration of each episode (in hours)		

Sign of participation

Master Chart

Yoga Group				
Age	**Gender**	**Pre MIDAS**	**Post MIDAS**	**Improvement**
49	F	23	10	56.52%
46	M	27	13	51.85%
41	M	25	13	48.00%
48	M	26	10	61.54%
29	F	21	12	42.86%
43	F	24	13	45.83%
50	F	20	14	30.00%
47	M	19	13	31.58%
49	M	22	15	31.82%
47	F	21	13	42.86%
39	F	23	12	47.83%
33	F	21	15	28.57%
32	F	22	16	27.27%
30	F	24	12	33.33%
30	M	23	12	47.83%
49	F	24	16	50.00%
42	M	21	14	23.81%
41	M	22	10	54.55%
47	F	21	11	47.62%
47	F	21	13	38.10%
31	M	25	19	24%
39	F	25	17	18%
49	M	22	11	50%
36	F	26	18	30.77%
43	F	21	14	33.33%
30	M	26	17	34.62%
40	M	25	17	32%
31	F	23	11	52.17%
42	M	22	16	27.27%
47	F	21	16	23.81%
35	F	23	17	26.09%
30	F	21	16	23.81%
39	F	24	12	50%

44	M	21	10	52.38%
36	F	22	16	27.27%
50	F	23	17	26.09%
47	F	24	13	45.83%
44	M	21	10	52.38%
39	F	25	21	16%
44	M	21	14	33.33%

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